

IN THE TITLE

Please replace the present title with the following:

--CORRECTION DATA OUTPUT DEVICE, CORRECTION DATA
CORRECTING METHOD, FRAME DATA CORRECTING METHOD, AND FRAME
DATA DISPLAYING METHOD--

AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph beginning on page 5, line 1 with the following amended paragraph:

Fig. 3 is a flowchart showing operation of ~~a frame data~~an image correction device according to Embodiment 1.

Please replace the paragraph beginning on page 6, line 19 with the following amended paragraph:

The receiver 2 outputs frame data Di1 corresponding to one of frames (hereinafter also referred to as image) included in the image signal to ~~a frame~~the image data correction device 3. In this respect, the frame data Di1 are the ones that include a signal corresponding to brightness, density, etc. of the frame, a color-difference signal, etc., and control a liquid crystal drive voltage. In the following description, frame data to be corrected by the ~~frame data~~image correction device 3 are referred to as object frame data, and a frame corresponding to the foregoing object frame data is referred to as object frame.

Please replace the paragraph beginning on page 6, line 29 with the following amended paragraph:

The ~~frame data~~image correction device 3 outputs corrected frame data Dj1 obtained by correcting the object frame data Di1 to a display device 11. The display device 11 displays the object frame on the basis of the inputted corrected frame data Dj1 described above. This Embodiment 1 shows an example in which the display device 11 is comprised of a liquid crystal panel.

Please replace the paragraph beginning on page 7, line 5 with the following amended paragraph:

Described below is operation of the ~~frame data~~image correction device 3 according to this Embodiment 1.

Please replace the paragraph beginning on page 7, line 7 with the following amended paragraph:

An encoder 4 in the ~~frame data~~image correction device 3 encodes the object frame data Di1 inputted from the receiver 2. Then, the encoder 4 outputs first encoded data Da1 obtained by encoding the object frame data Di1 to a delay device 5 and a first decoder 6. It is possible for the encoder 4 to encode the frame data by employing any coding method for static image including block truncation coding (BTC) method such as FBTC or GBTC, two-dimensional discrete cosine transformation coding method such as JPEG, predictive coding method such as JPEG-LS, or wavelet transformation method such as JPEG2000. It is also possible to employ either a reversible coding method in which frame data after encoding completely coincides with frame data before encoding, or a non-reversible coding method in which frame data after encoding do not completely coincide with the frame data before encoding as the mentioned coding method for static image. It is further possible to employ either a fixed-length coding method in which quantity of code is fixed or a variable-length coding method in which quantity of code is not fixed.

Please replace the paragraph beginning on page 10, line 26 with the following amended paragraph:

The operation of the ~~frame data~~image correction device 3 described above can be shown in the flowchart ~~in~~ of Fig. 3. In first step St1 (step of encoding the image data), the encoder 4 encodes the object frame data Di1.

Please replace the paragraph beginning on page 11, line 24 with the following amended paragraph:

The object frame data Di1, the previous frame reproduction image data Dp0 outputted from the previous frame image reproducer 9, and the change quantity Dv1 outputted from the change-quantity calculating device 8 are inputted to a correction data output device 30. The correction data output device 30 outputs correction data Dm1 to a ~~subtractor~~adder 15 on the basis of the mentioned object frame data Di1, the mentioned previous frame reproduction image data Dp0, and the mentioned change quantity Dv1.

Please replace the paragraph beginning on page 12, line 2 with the following amended paragraph:

In the ~~subtractor~~adder 15, the object frame data Di1 is corrected by adding the mentioned correction data Dm1 to the mentioned object frame data Di1, and the corrected frame data Dj1 obtained through the mentioned correction is outputted to the display device 11.

Please replace the paragraph beginning on page 12, line 12 with the following amended paragraph:

This LUT 12 outputs LUT data Dj2 to a ~~subtractor~~adder 13 on the basis of the mentioned object frame data Di1 and the mentioned previous frame reproduction image data Dp0. The LUT data Dj2 are data that make it possible to complete the change in gradation in the liquid crystal panel of the display device 11 within one frame period.

Please replace the paragraph beginning on page 16, line 11 with the following amended paragraph:

The ~~subtractor~~adder 13 in Fig. 4, where the LUT data Dj2 is inputted from the LUT 12 where the LUT data Dj2 is set as described above, outputs

correction data Dk1 obtained by subtracting the object frame data Di1 from the foregoing LUT data Dj2 to a correction data controller 14.

Please replace the paragraph beginning on page 16, line 16 with the following amended paragraph:

The correction data controller 14 is provided with a threshold value Th. If the change quantity Dv1 outputted from the change-quantity calculating device 8 is smaller than the foregoing threshold value Th, the correction data controller 14 corrects the correction data Dk1 so as to diminish the correction data Dk1 in size and outputs the corrected correction data Dm1 to the ~~subtractor-adder~~ 15. In concrete terms, the foregoing corrected correction data Dm1 is produced through the following expressions (1) and (2).

$$Dm1 = k \times Dk1 \quad (1)$$

$$k = f(Th, Dv1) \quad (2)$$

$$\text{where: } 0 \leq k \leq 1$$

$k = f(Th, Dv1)$ is an arbitrary function that becomes 0 when $Dv1 = 0$. Instead of using the function as the coefficient k as shown in the foregoing expression (2), it is also preferable to arrange plural threshold values and output the coefficient k according to the value of the change quantity Dv1 corresponding to the picture element of the liquid crystal panel of the display device 11 as shown in Fig. 10. The foregoing threshold value Th is set according to the structure of the system, the material characteristics of the liquid crystal used in the system, and so on. Although plural threshold values are set in Fig. 10, it is also preferable to arrange only one threshold value as a matter of course. Although the change quantity Dv1 is used in the foregoing description, it is also possible to control the correction data Dk1 on the basis of $(Di1 - Dp0)$ in place of the foregoing change quantity Dv1.

Please replace the paragraph beginning on page 17, line 18 with the following amended paragraph:

In Fig. 11, the object frame data Di1 is inputted to a ~~subtractor~~adder 20. Data corresponding to a halftone (Data corresponding to a halftone is hereinafter referred to as halftone data.) is inputted from halftone data outputting means 21 to the ~~subtractor~~adder 20.

Please replace the paragraph beginning on page 17, line 23 with the following amended paragraph:

The ~~subtractor~~adder 20 subtracts the foregoing halftone data from the foregoing object frame data Di1 and outputs a signal corresponding to number of gradations of the object frame (A signal corresponding to number of gradations of the object frame is hereinafter referred to as a gray-level signal w.) to the LUT 12.

Please replace the paragraph beginning on page 17, line 28 with the following amended paragraph:

The halftone data can be any data corresponding to a halftone in the gradations that can be displayed on the display device 11. The gray-level signal w outputted from the ~~subtractor~~adder 20 when data corresponding to 1/2 gray level is outputted from the halftone data outputting means is ~~going to be explained below~~ with reference to Fig. 12.

Please replace the paragraph beginning on page 18, line 15 with the following amended paragraph:

In the case of (1) in the drawing, the object frame data Di1 is the data corresponding to the gray-level ratio 1/2, therefore $w = 0$ is outputted from the ~~subtractor~~adder 20 by subtracting 1/2 gray level data from the foregoing subject frame data Di1.

Please replace the paragraph beginning on page 18, line 19 with the following amended paragraph:

In the same way, in the case of (2) in the drawing, the object frame data Di1 is the data corresponding to the gray-level ratio 1, therefore $w = 1/2$ is outputted from the ~~subtractor~~-adder 20. In the case of (3) in the drawing, the object frame data Di1 is the data corresponding to the gray-level ratio $1/4$, therefore $w = -1/4$ is outputted from the ~~subtractor~~-adder.

Please replace the paragraph beginning on page 19, line 6 with the following amended paragraph:

Fig. 13 shows another example of the correction data output device 30. In Fig. 13, the object frame data Di1 is inputted to gray-level change detecting means 22 and the ~~subtractor~~-adder 20.

Please replace the paragraph beginning on page 19, line 9 with the following amended paragraph:

The ~~subtractor~~-adder 20 outputs the gray-level signal w on the basis of the object frame data Di1 and the halftone data as described above. On the other hand, the foregoing gray-level change detecting means 22 outputs a signal (hereinafter referred to as a gray-level change signal) corresponding to a change in number of gradations between the object frame and the frame which is one frame previous to the foregoing object frame to the LUT 12 on the basis of the object frame data Di1 and the previous frame reproduction image data Dp0. The gray-level change signal is, for example, produced through an operation such as subtraction on the basis of the object frame data Di1 and the previous frame reproduction image data Dp0 and outputted, and it is also preferable to arrange an LUT and output the data from the foregoing LUT.

Please replace the paragraph beginning on page 19, line 26 with the following amended paragraph:

It is preferable that data obtained by adding the correction data to the frame data corresponding to the desired number of gradations as described above or the foregoing correction data is set as the foregoing LUT data Dj2 recorded on the LUT. It is also preferable to set a coefficient so that the foregoing object frame data Di1 is corrected by multiplying the object frame data Di1 by this coefficient. In the case where the mentioned correction data or the coefficient is set as the LUT data Dj2, it is not necessary to arrange the ~~subtractor-adder~~ adder 13 in the correction data output device 30, therefore the foregoing correction data output device is constructed as shown in, for example, Fig. 14, and the foregoing LUT data Dj2 is outputted as the correction data Dk1.

Please replace the paragraph beginning on page 20, line 28 with the following amended paragraph:

Fig. 15 is a graphic diagram showing the display gradation of the frame displayed on the display device 11 in the case where the change quantity Dv1 is larger than the threshold value Th, i.e., when the correction data Dk1 is not corrected. Referring to Fig. 15, (a) indicates value of the object frame data Di1, and (b) indicates value of the corrected frame data Dj1. Fig. 15 (c) indicates change in display gradation of the frame displayed on the display device 11 on the basis of the corrected frame data Dj1. In Fig. ~~9-15~~ 15 (c), the change in display gradation indicated by the broken line is the one in the gradation in the case where the frame is displayed on the display device 11 on the basis of the object frame data Di1.

Please replace the paragraph beginning on page 24, line 16 with the following amended paragraph:

Referring to Fig. 17, the object frame data $Di1$, the previous frame reproduction image data $Dp0$, and the change quantity $Dv1$ are inputted to a correction data output device 31 disposed in the frame data correction device 10 according to this Embodiment 2. The mentioned object frame data $Di1$ is inputted also to the ~~subtractor~~adder 15.

Please replace the paragraph beginning on page 24, line 22 with the following amended paragraph:

The correction data output device 31 outputs the correction data $Dm1$ to the ~~subtractor~~adder 15 on the basis of the mentioned object frame data $Di1$, the previous frame reproduction image data $Dp0$ and the change quantity $Dv1$.

Please replace the paragraph beginning on page 24, line 26 with the following amended paragraph:

The ~~subtractor~~adder 15 outputs the corrected frame data $Dj1$ to the display device 11 on the basis of the mentioned object frame data $Di1$ and the correction data $Dm1$.

Please replace the paragraph beginning on page 25, line 17 with the following amended paragraph:

The first data converter 16 outputs a first interpolation coefficient ~~$k0$~~ $k1$ to an interpolator 19, and the second data converter 17 outputs a second interpolation coefficient ~~$k1$~~ $k0$ to the interpolator 19. The mentioned first interpolation coefficient $k1$ and the second interpolation coefficient $k0$ are coefficients used in data interpolation in the interpolator 19, which are described later in detail.

Please replace the paragraph beginning on page 26, line 15 with the following amended paragraph:

The LUT 18 is composed of (9×9) LUT data as shown in Fig. ~~12~~18. This is because the mentioned first bit reduction data De1 and the second bit reduction data De0 are data of 3 bits and have values each corresponding to a value from 0 to 7 and because the LUT 18 outputs the mentioned second LUT data Df2 and so on.

Please replace the paragraph beginning on page 26, line 20 with the following amended paragraph:

Interpolation frame data Dj3, which are obtained through data interpolation on the basis of the mentioned LUT data outputted from the LUT 18 as described above, the first interpolation coefficient ~~k0~~k1 outputted from the mentioned first data converter and the second interpolation coefficient ~~k1~~k0 outputted from the mentioned second data converter, are outputted from the interpolator 19 shown in Fig. 17 to the ~~subtractor~~adder 13.

Please replace the paragraph beginning on page 28, line 19 with the following amended paragraph:

The interpolation frame data Dj3 calculated through the interpolation operation shown in the above expression (3) is outputted to the ~~subtractor~~adder 13 in Fig. 17. Subsequent operation is carried out in the same manner as in the correction data output device 30 in the foregoing Embodiment 1. Although the interpolator 19 in this Embodiment 2 carries out in the form of linear interpolation, it is also preferable to calculate the interpolation frame data Dj3 through an interpolation operation using a higher order function.